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Optimal concentration of local well brine groundwater irrigation for *Bamboo willow* introduced to the arid areas in northern Xinjiang province, China

Wei Han (1), Ling Cao (2), Ya Zhang (3), Kaiqiang Cui (4), and Shengli Wu (5)

(1) The School of Geographic Sciences and Tourism, Xinjiang Normal University, Urumqi Xinjiang, China (hanweiaaa@163.com), (2) College of Mathematics and Physics Sciences, Xinjiang Agricultural University, Urumqi, China(403590148@qq.com), (3) The School of Geographic Sciences and Tourism, Xinjiang Normal University, Urumqi Xinjiang, China(o10201020@qq.com), (4) The School of Geographic Sciences and Tourism, Xinjiang Normal University, Urumqi Xinjiang, China(1193168504@qq.com), (5) The School of Geographic Sciences and Tourism, Xinjiang Normal University, Urumqi Xinjiang, China(wushengli77@126.com)

The adaptation and survive of introduced plants to local well brine groundwater irrigation is an important issue, while people introduce some plants to improve the local environment in the construction of urban greening oases in arid areas, north China. We measured some of the photosynthetic characteristics of introduced *Bamboo willow* irrigated by different local well brine groundwater in the wild controlled experiments, in May 2014 in Kelamayi city in north China, which to seek the most appropriate irrigation concentration of underground saline water, and to clarify the physiological ecological adaptation to the local habitat. The parameters, measured by Li-6400XT, a portable photosynthesis system, include the following ones, net photosynthetic rate (Pn), stomatal conductance (Gs), transpiration rate (Tr), the internal CO_2 concentration (Ci) and efficiency of water application (WUE) of one-year old introduced *Bamboo willow* irrigated by set salinity groundwater gradient, as 0 g/L, 5 g/L and 10 g/L. the results showed that (1) In each salt water concentration, the diurnal variation curve of net photosynthetic rate showed as "bimodal curve" style, and obvious "midday depression". (2) The parameter Pn of *Bamboo willow* irrigated by salt water of 5g/L was highest compared with the other two, and the value Pn irrigated by salt water concentration of 10g/L down. The net photosynthetic rate would increase in the salt concentration of 10g/L. In conclusion, the salt groundwater concentration of 10g/L was the optimal concentration of local well brine groundwater irrigation for *Bamboo willow* introduced to the arid areas in northern Xinjiang province, China.